Operational Range Assessment Program (ORAP) Phase II Overview

Andrea Graham
USACE, Baltimore District
andrea.a.graham@usace.army.mil

MALCOLM PIRNIE

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Report Documentation Page

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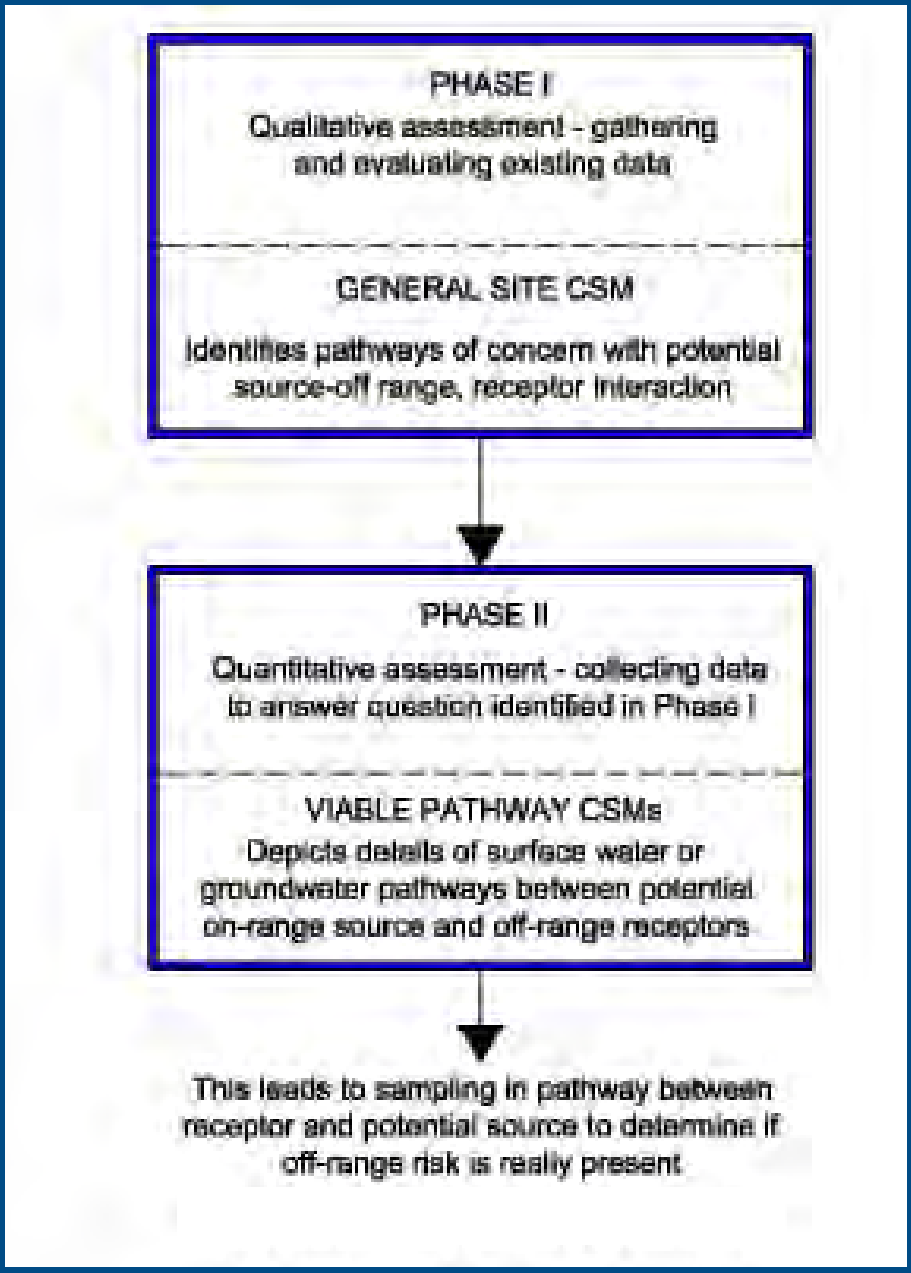
Army Environmental Military Munitions Programs

- ORAP is part of the Sustainable Range Program (SRP), which also includes Operational Range Inventory Sustainment (ORIS)
  - ORAP is a comprehensive effort to identify and evaluate off-range munitions constituents (MC) impacts from operational ranges (as defined in TC 25-8), and to ensure continuity of training missions at these ranges
  - SRP Tenet: Information Excellence – Ensure the Army has the best available data to support operational ranges
- MMRP is a program element of DERP (September 2001)
  - Documents MC impacts from other than operational military ranges and munitions sites
  - MMRP includes FUDS, BRAC, and CTT sites

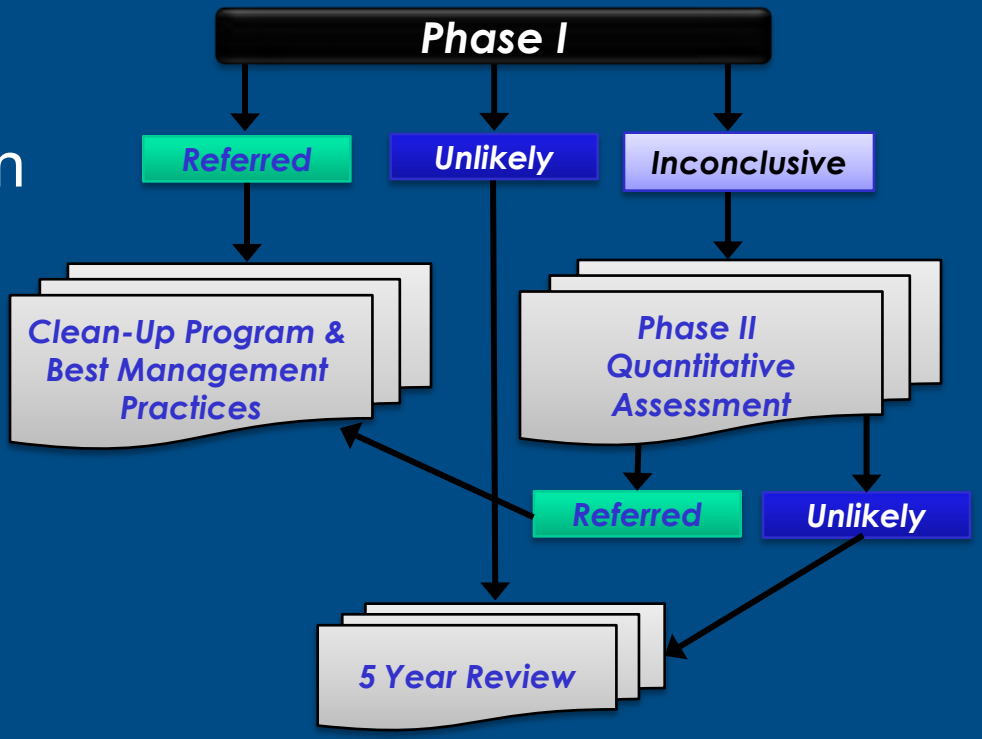
Coordination efforts are underway between the two programs to reduce burden to installations



ORAP Assessments use a phased approach and are based on Source – Receptor Interactions

Phase II Assessment Overview

- Phase II Assessments will occur where Phase I Assessments indicate *Inconclusive* categorization
- Phase II is planned to start in FY10
- Sample and analyze migration pathway media
  - Use accepted processes to determine the number and locations of samples
  - Analyze for MCOC using approved analytical methods



Phase II Quantitative Assessment – Pilot Studies

- USACHPPM's Recommended Phase II Approach
  - Develop installation-specific HSPs
  - Develop DQOs using EPA guidance
  - Develop QAPPs using UFP-QAPP
  - Address SW and GW pathways only
  - Develop detailed Viable Pathway CSMs (discussion and illustration)
    - Incorporate non-range influences and degradation
    - Select effective sample locations
  - GW sampling at/near sources (not on Impact Areas) or exposure points
  - SW sampling
    - Account for temporal variability (wet/dry seasons, high/low flow events)
    - Use SW decision flow chart

Phase II Quantitative Assessment – Pilot Studies

- USACHPPM's Recommended Phase II Approach (continued)
  - Ecological Risk Assessments – aquatic receptors only
    - Background and 95% UCL of mean results vs. screening levels comparison
    - Benthic macroinvertebrate surveys – false Positive / Negative
  - Human Health Risk Evaluations
    - Initial data screening – direct comparison to screening levels
    - Quantitative data screening – determine need for HHRA
  - Installation-specific Phase II reports categorizing each formerly Inconclusive range as either Unlikely or Referred
  - Referred categorization must be based on Risk Assessment results – not just on Phase II data

Phase II ORAP Roles & Responsibilities

- ISE has overall Army responsibility for Range Assessment Program including funding and guidance
- G3 provides HQDA level operator input
- AEC and NGB are the Program Managers for Phase II Assessments with responsibility for:
  - Upward and downward reporting
  - Disburse funding
  - Implement protocol as guidance
  - Data repository
  - Scheduling
- USACHPPM provides technical oversight
- Contract mechanism for Phase II Assessments will consist of AE IDQ and Multiple Award Military Munitions contracts

ORAP Phase II Pilot
USAG Fort Jackson / McCrady Training Center

Rhonda Stone
Malcolm Pirnie, Inc.
rstone@pirnie.com

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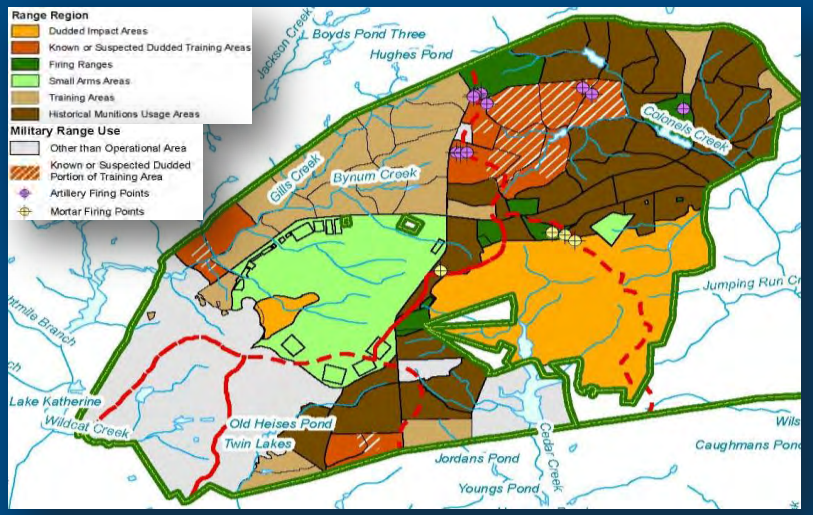
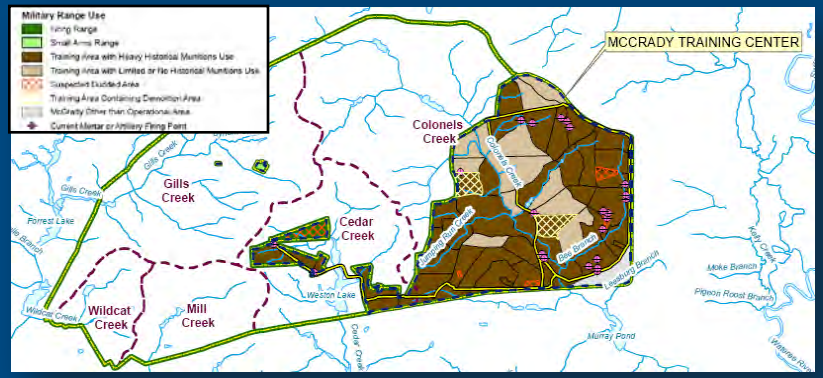
Installation Overview / Fast Facts

- Fort Jackson -
  - Army owned/operated 36,971 acres (+15,267 acres operated by SCARNG)
  - Used 1917 to present for Basic & Advanced Infantry Training
  - 29,475 operational acres / 16,471 categorized as Inconclusive
  - 104 operational ranges / 51 categorized as Inconclusive



- McCrady Training Center -
  - Army owned/NGB operated
  - 15,267 acres in total
  - Used by SCARNG since 1943
  - 14,895 operational acres / 12,243 categorized as Inconclusive
  - 62 operational ranges / 48 categorized as Inconclusive

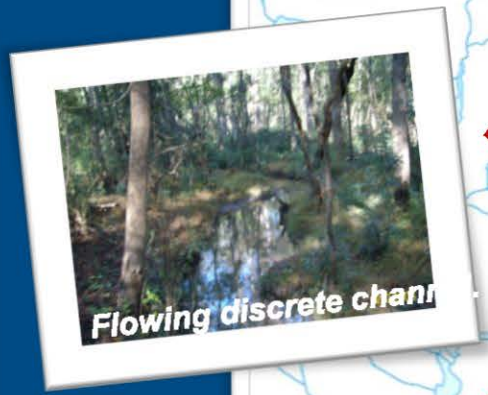


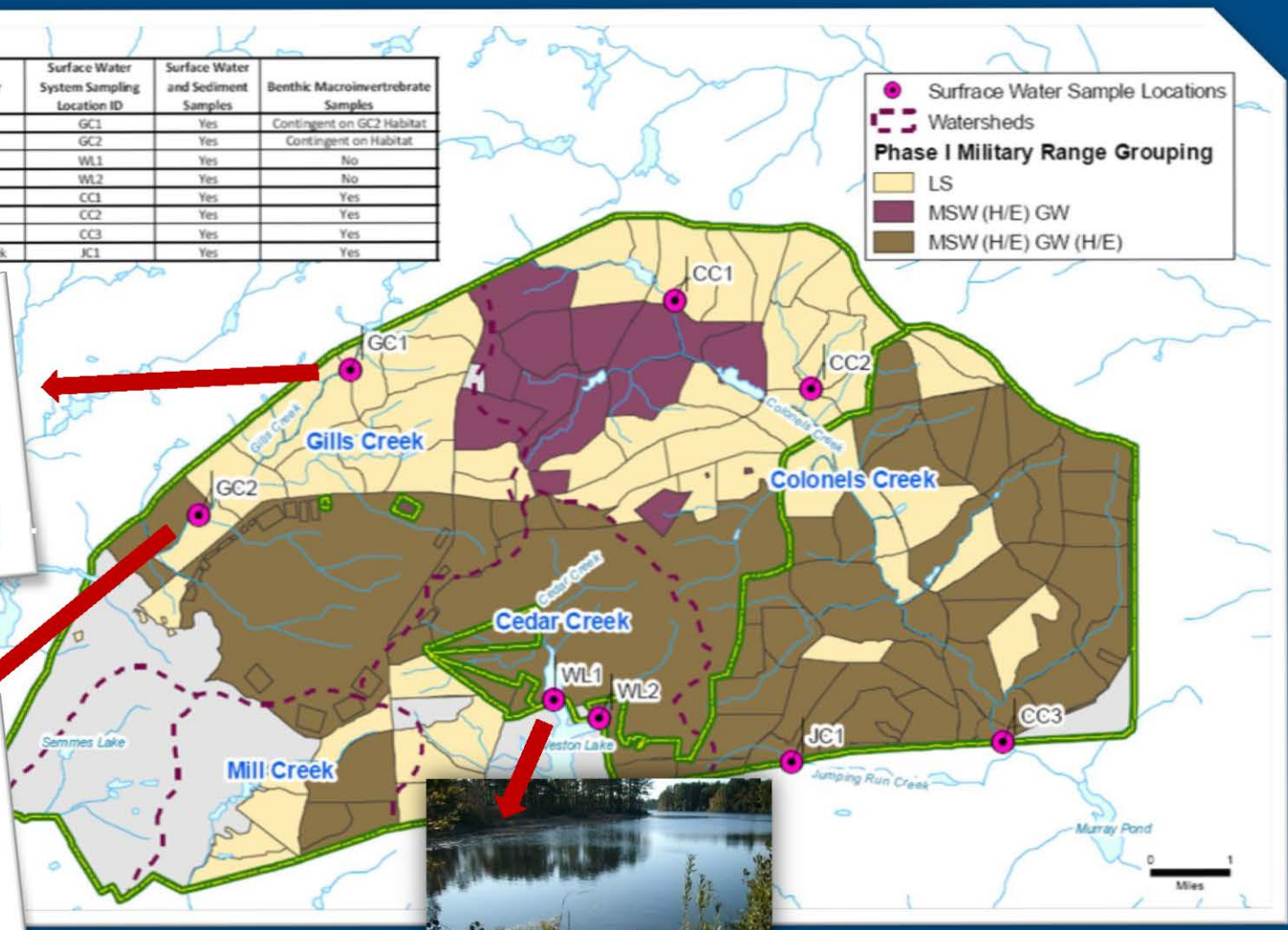
Combined Installation Phase II Pilot Study Advantages

- Able to obtain additional surface water/sediment data for both installations with minimal added effort - better determine if a source area is up-stream within each watershed
- Same up-stream (background) and down-stream surface water/sediment sample locations used for both installations - additional McCrady TC only locations no longer needed
- Able to add piezometers to better determine groundwater direction, depth, and subsurface geology (= better groundwater sample location siting)
- Additional down-gradient groundwater sample locations can used for both installations
- Provide information on potential impacts migrating off the combined installation boundary rather than just the Fort Jackson or McCrady TC boundary
- Combined sampling effort decreases impacts to training activities

Surface Water Pathway Sampling Locations

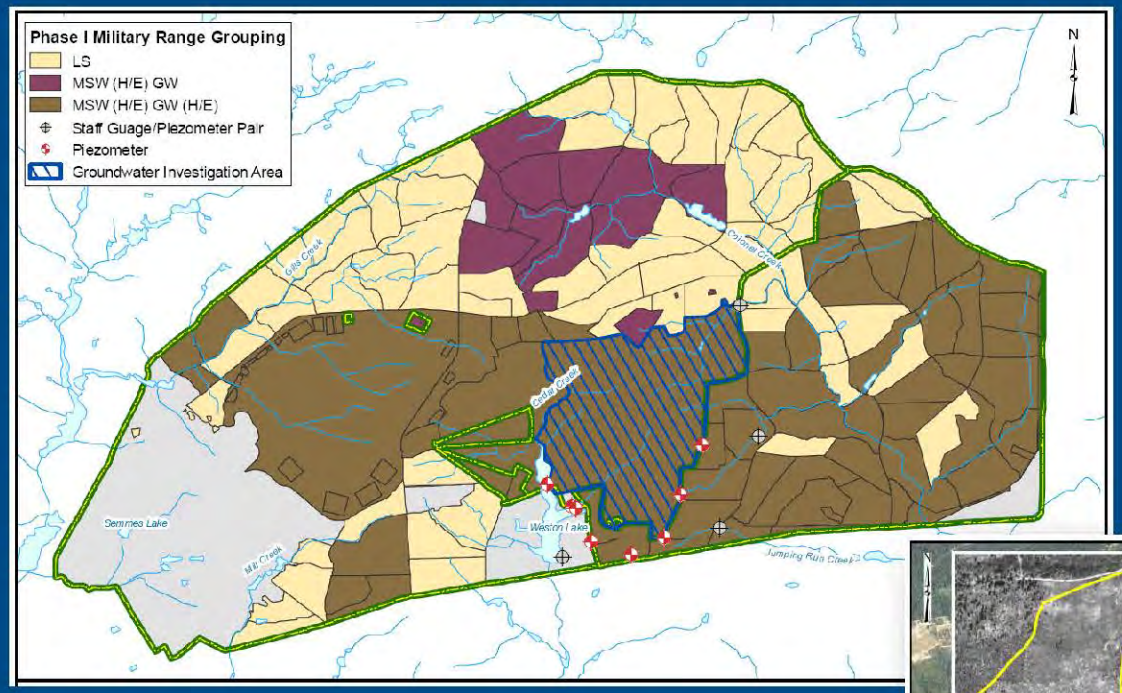
Surface Water Feature	Surface Water System Sampling Location ID	Surface Water and Sediment Samples	Benthic Macroinvertebrate Samples
Gills Creek	GC1	Yes	Contingent on GC2 Habitat
Gills Creek	GC2	Yes	Contingent on Habitat
Weston Lake	WL1	Yes	No
Weston Lake	WL2	Yes	No
Colonel Creek	CC1	Yes	Yes
Colonel Creek	CC2	Yes	Yes
Colonel Creek	CC3	Yes	Yes
Jumping Run Creek	JC1	Yes	Yes

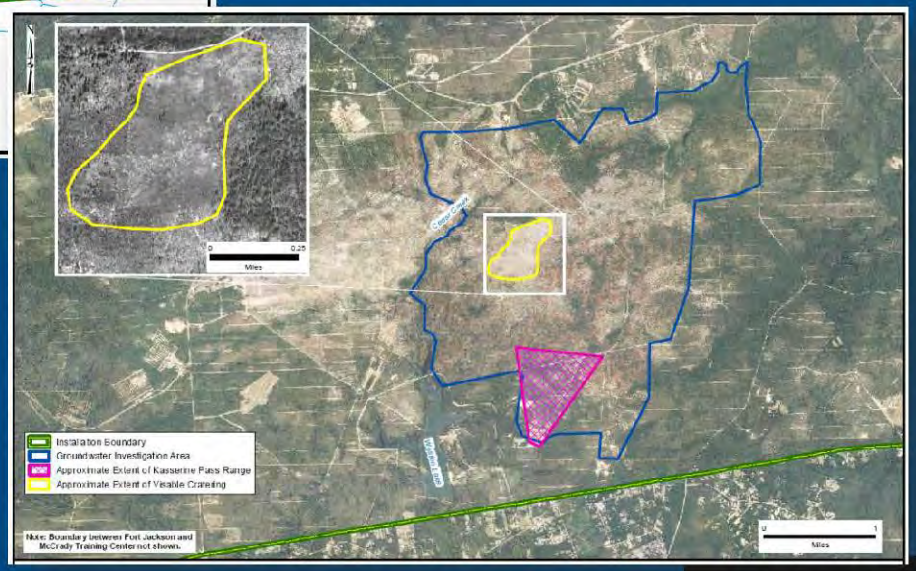




Boat Access. Vertical composite Grab Samples. No Benthic Macroinvertebrates.

Groundwater Pathway Sampling Locations - Multi-Phase Groundwater Approach





Pilot Technologies

X-50 Mobile XRF

Specifications:

- 50kV, 200µA x-ray tube for up to 25X power over a handheld instrument
- High resolution Si PiN diode detector that delivers < 190 eV resolution (FWHM Mn K-alpha line) in a proven, field-rugged package
- Rugged, injection molded, sealed carrying case and sealed test platform
- Powerful Pentium processor, embedded XP and sealed, field-hardened color touchscreen
- Multiple analysis modes including Fundamental Parameters, Compton Normalization, Empirical Calibration models, Spectral Matching
- 6-position primary beam filters for optimal performance across the periodic table
- Sample platform with interlocked testing cover
- AC Power or 3 hours Li-ion battery power with optional battery pack (typical duty cycles)
- Total weight 20 lbs/9 kg
- Dimensions (approx.) 12" x 13" x 8" in./ 30 x 33 x 20 cm
- Sample chamber dimensions 12" x 8" x 5" / 30 x 20 x 12.5 cm

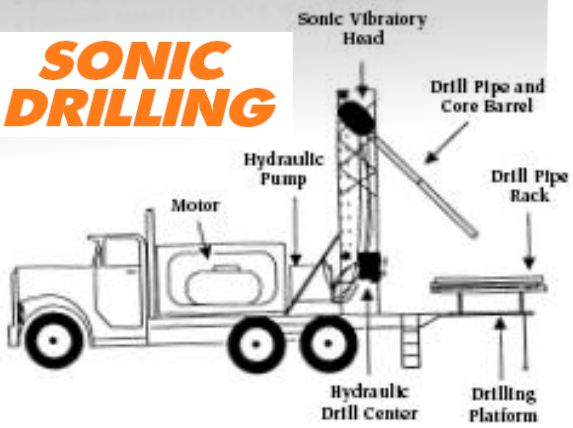
Glacier® Portable Refrigerated Sampler

Active cooling in a portable sampler!

Isco's Glacier® Sampler combines the small size, light weight, and mobility of a portable with an exclusive active temperature control system. Its revolutionary design gives you the best of all worlds: easy transport, quick setup, and accurate sample preservation – without reliance on ice *or* utility power!

Glacier can be powered by 12V DC or AC line voltage. In the field, Glacier delivers 48 hours or more of refrigeration from a 12 volt deep cycle battery. Its power-saving cooling system stands by until the first sample is drawn. Glacier can wait patiently for days or weeks to collect event-triggered samples, and then preserve them until a convenient pickup time.

SONIC DRILLING



Pilot Schedule

Activity	Anticipated Schedule
Kick-off Meeting	September 2008
Reconnaissance Walk/Coordination Meeting	October 2008
Work Plan Preparation	October 2008 - February 2009
Review Period	February 2009
Final Work Plan (with UFP-QAPP)	March 2009
Field Sampling	March 2009 - July 2009
Data Validation / Quantitative Assessment Report Preparation	May 2009 - December 2009
Review Period	December 2009
Final Quantitative Assessment Report	January 2010

ORAP Phase II Pilot
Fort A.P. Hill

Dave Mercadante
EA Engineering, Science, and Technology
dmercadante@eaest.com

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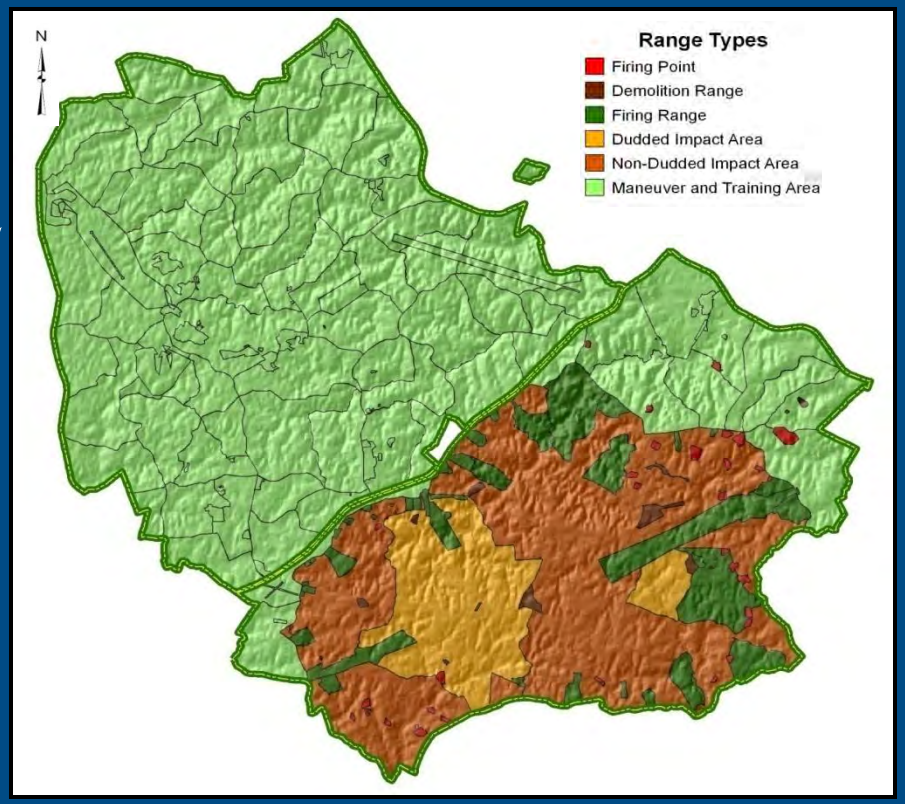
Installation Overview / Fast Facts

Fort A.P. Hill, Virginia

- *U.S. Army owned/operated*
- *Active since 1941*
- *228 operational ranges*
- *74,262 acres*



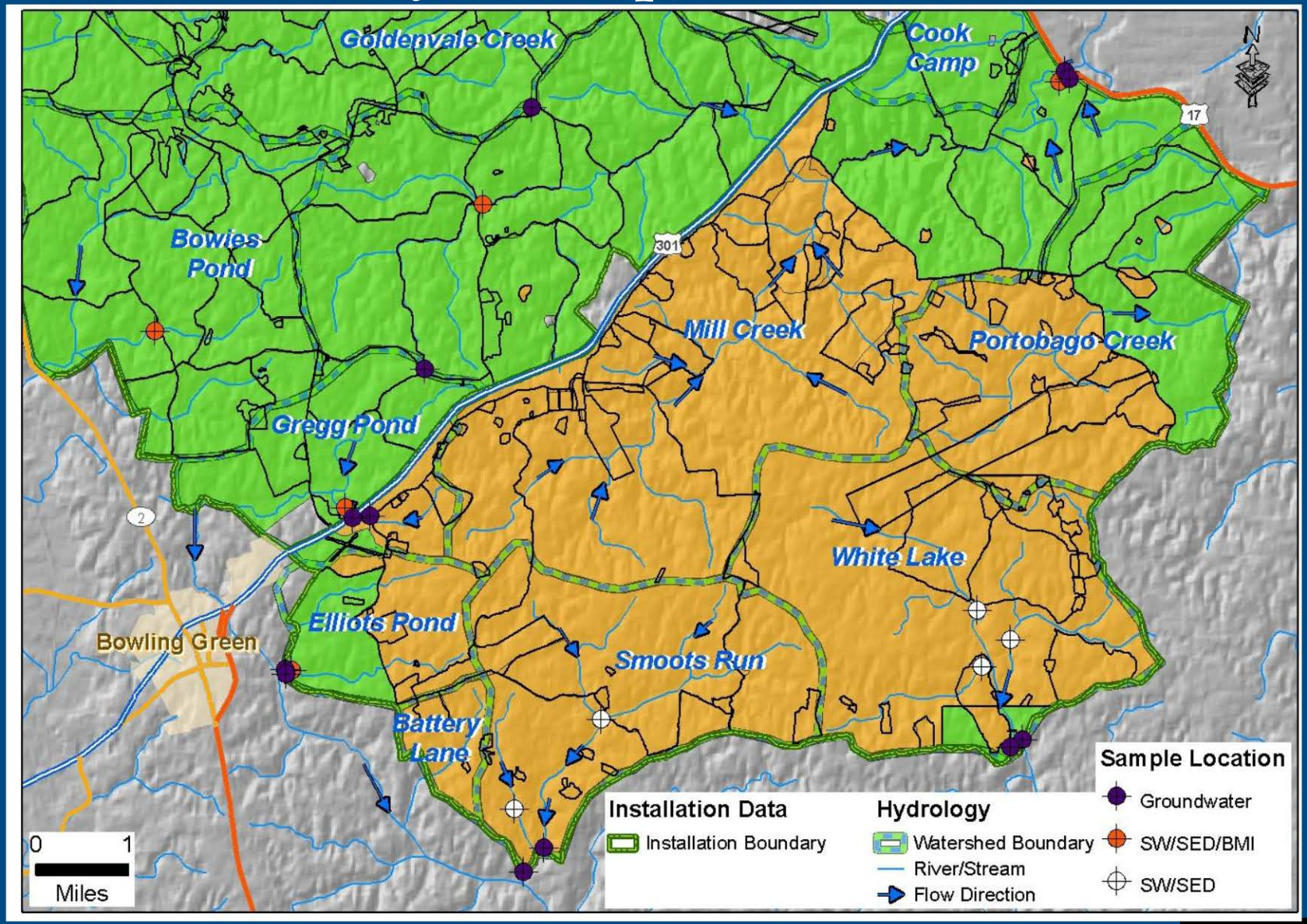
Phase I Conclusions

- *Unlikely - 128 operational ranges, 47,641 acres*
- *Inconclusive - 100 operational ranges, 26,621 acres*

Piloting the Protocol

- The identified sources, pathways, and receptors at installation allow full testing of Technical Protocol
  - Training history means typical programmatic constituents potentially present on site
  - Main programmatic transport pathways identified from multiple source types
    - Well defined surface water flow and discharge points for multi-seasonal sampling
    - Groundwater sampling at both source discharge and potential exposure points
    - Habitat conditions present for testing application of benthic macroinvertebrate dip net sampling
- Site location allows comparisons of protocol application between Fort A.P. Hill and USACHPPM pilot site in Virginia
- Site is easily accessible for evaluation by USAEC, USACHPPM, and USACE program managers and technical oversight

Pathway Conceptual Site Model



Proving the Concept

- Application of Worst Case Scenario application
  - Similarities in models of source, pathway, and receptor between watersheds allow for a focused approach
- Establishing a baseline for storm event sampling
  - Installation of rain gauges, transducers and barometers in multiple watersheds to identify parameters necessary for true storm transport
- Comparison of multi-seasonal benthic sampling results
  - Measure application of a single season approach
  - Measure application of using historical benthic data
  - Assess value of AVS-SEM analysis

- Cost-Benefit analysis of USEPA Method 1638

Project Schedule – Fort A.P. Hill

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